


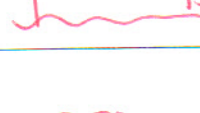



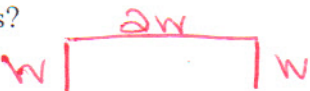
Example # 3:

Ryan has a summer job working at a campground. He is roping off a rectangular swimming area on the beach at Swan Lake. In the equipment shed, Ryan found a rope with 50 buoys, equally spaced at 6 foot intervals, and two support stakes to anchor the buoy rope. Ryan does not need to run the buoys along the edge of the beach, so he only needs to make three sides of a rectangle in the water.

- a) How much rope does Ryan have in total? 300 ft
- b) We want to maximize the swimming area while maintaining a fixed perimeter using all of the rope. Complete the table below for several possible rectangular swimming areas.

Sketch	Length (feet)	Width (feet)	Perimeter (feet)	Area (ft ²)
	50	125	300	6250
	100	100	300	10000
	150	75	300	11250
	200	50	300	10000
	250	25	300	6250

- c) What is the optimum area (ie: the maximum) given our fixed perimeter? 11250
- d) What dimensions were used to create this optimum area? 150 x 75
- e) Can you see a pattern between the length and width of your rectangle? $L = 2W$
- f) Is the type of rectangle that gives a maximum area for a given perimeter the same when enclosing three sides as when enclosing four sides?

 $P = 4w \Rightarrow \text{SAME}$